

WHAT IS CLAIMED IS:

Sub A' 1. A method of optimizing execution of a query that accesses data stored on a data store connected to a computer, comprising:
using statistics on one or more automatic summary tables to determine an optimal query execution plan for the query.

2. The method of claim 1, further comprising generating cardinality estimates for one or more query execution plans for the query using statistics of one or more automatic summary tables that vertically overlap the query.

3. The method of claim 2, wherein the statistics of the one or more automatic summary tables are used to improve a combined selectivity estimate of one or more predicates of the query.

4. The method of claim 3, wherein the predicates are applied by one of the automatic summary tables.

5. The method of claim 4, wherein the selectivity estimate comprises a ratio of a cardinality of the automatic summary table to a product of cardinalities of base tables referenced in the automatic summary table and the query.

6. The method of claim 3, wherein zero or more predicates of the query are applied by one of the automatic summary tables and wherein the remaining predicates are eligible to be applied on the automatic summary table.

7. The method of claim 6, wherein a predicate is eligible to be applied on the automatic summary table if it can be evaluated using the output columns and expressions of the automatic summary table.

1 8. The method of claim 7, further comprising determining a subpredicate combined
2 selectivity estimate of the unapplied eligible predicates using column distribution statistics of the
3 automatic summary table.

1 9. The method of claim 8, wherein a cardinality ratio comprises a ratio of a cardinality of
2 the automatic summary table to a product of cardinalities of base tables referenced in the automatic
3 summary table and the query.

1 10. The method of claim 9, wherein the selectivity estimate comprises a product of the
2 subpredicate combined selectivity estimate and the cardinality ratio.

1 11. An apparatus for optimizing execution of a query, comprising:
2 a computer having a data store coupled thereto, wherein the data store stores data;
3 one or more computer programs, performed by the computer, for using statistics on one or more
4 automatic summary tables to determine an optimal query execution plan for the query.

1 12. The apparatus of claim 11, further comprising generating cardinality estimates for one
2 or more query execution plans for the query using statistics of one or more automatic summary tables that
3 vertically overlap the query.

1 13. The apparatus of claim 12, wherein the statistics of the one or more automatic summary
2 tables are used to improve a combined selectivity estimate of one or more predicates of the query.

1 14. The apparatus of claim 13, wherein the predicates are applied by one of the automatic
2 summary tables.

1 15. The apparatus of claim 14, wherein the selectivity estimate comprises a ratio of a
2 cardinality of the automatic summary table to a product of cardinalities of base tables referenced in the
3 automatic summary table and the query.

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23. The article of manufacture of claim 22, wherein the statistics of the one or more automatic summary tables are used to improve a combined selectivity estimate of one or more predicates of the query.

24. The article of manufacture of claim 23, wherein the predicates are applied by one of the automatic summary tables.

25. The article of manufacture of claim 24, wherein the selectivity estimate comprises a ratio of a cardinality of the automatic summary table to a product of cardinalities of base tables referenced in the automatic summary table and the query.

26. The article of manufacture of claim 23, wherein zero or more predicates of the query are applied by one of the automatic summary tables and wherein the remaining predicates are eligible to be applied on the automatic summary table.

27. The article of manufacture of claim 26, a predicate is eligible to be applied on the automatic summary table if it can be evaluated using the output columns and expressions of the automatic summary table.

28. The article of manufacture of claim 27, further comprising determining a subpredicate combined selectivity estimate of the unapplied eligible predicates using column distribution statistics of the automatic summary table.

29. The article of manufacture of claim 28, wherein a cardinality ratio comprises a ratio of a cardinality of the automatic summary table to a product of cardinalities of base tables referenced in the automatic summary table and the query.

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1 30. The article of manufacture of claim 29, wherein the selectivity estimate comprises a
2 product of the subpredicate combined selectivity estimate and the cardinality ratio.

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